Subject: INFORMATION: Yaw Angle for the Down Test in Dynamic Seat Test, § 25.562

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From: Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100 DATE

Reply to Attn of:

To: Managers, ACE-100, ANE-100, ASW-100, AIR-100, AEU-100

A new regulation concerning improved seat restraint criteria (§ 25.562, Amendment 25-64) was issued on May 12, 1989. Section 25.562 requires a minimum of two dynamic tests of passenger and crew seats that are approved for occupancy during takeoff and landing. These two tests are a forward test and a down test. The forward test determines the protection provided in crashes where the predominant impact is in the longitudinal direction in combination with a lateral component. The down test determines the protection provided when the crash environment is such that a predominant impact load component is directed along the spinal column of the occupant in combination with a forward component. Since the issuance of Amendment 25-64 and Advisory Circular 25.562-1, issued on March 6, 1990, questions have been raised regarding the conduct of the down test.

The down test does not require yawing of the seat left or right with respect to the airplane longitudinal axis. The forward test does require yawing of the seat left or right with respect to the airplane longitudinal axis. However, if the actual installation of the seat in the airplane is yawed (i.e. seat track in the nonconstant section of the airplane is yawed or curved inboard) then this yaw angle must be considered in the down test and this installation yaw angle is in addition to the required yaw angle for the forward test.

Section 25.562(b) states each seat approved for passenger or crew occupant during takeoff and landing must successfully complete dynamic tests or be demonstrated by rational analysis based on dynamic tests of a similar type seat. To reduce the number of tests required to certify a family of seats, the applicant may prepare a rational analysis to determine the most critical configuration. As part of the analysis the applicant must include the yaw angle. In some cases, where the yaw angle is small and the rational analysis shows that the loads are very similar, the test may be conducted without the yaw angle in the down test. This determination should be made by the ACO responsible for approving the test plan.

For both the down and the forward tests it is the responsibility of the applicant to provide a rational analysis to determine the most critical configuration that should be tested. The reviewing office must determine which configurations should be tested and what limitation should be placed on the seat installation.

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